

[6th February 1925]

APPENDIX VI.

[Vide answer to question No. 195 asked by Mr. M. Ratnaswami at the meeting of the Legislative Council held on the 6th February 1925, page 382 supra.]

(1)

G.O. No. 107 L., dated 24th January 1918.

The importance of planting trees by the side of roads where there are now none and of improving existing avenues has on several occasions in recent years been impressed on presidents of district boards but though considerable attention is paid to the matter in some districts, the information contained in the various administration reports indicates that less interest is taken in tree planting in others, and that the best results are not always obtained for the money spent. The planting and maintenance of avenues are generally entrusted to the Local Fund Engineering establishment; and where the Engineer or members of the superior staff study the requirements of the roads and take trouble to ascertain the most suitable kinds of trees the arrangement no doubt works well. It is feared however that overseers often find it difficult to pay much real attention to avenues or have insufficient knowledge of the subject; that money is wasted through an undue dissipation of effort or through want of continuity of policy; and that trees of no permanent value are often planted for the sake of immediate effect. On the other hand credit is taken in some places for the planting of trees likely to bring in revenue without regard to their value for purposes of shade which is of course the most important function of an avenue tree.

2. It is understood that programmes of tree-planting extending over a period of years have been drawn up in most districts. The period covered, however, is generally comparatively short and the operations are scattered all over the districts; and it has been suggested to Government that better results might be obtained in some districts, at all events, on a system adopted recently in North Arcot. It was there resolved to make out a programme covering a period of 50 years and to concentrate operations in a small area at one time so that a small but full-time staff might be employed to attend solely to the planting and tending of trees until a sufficient number in that area were of a size to need no farther attention. The suggestion is commended to the presidents of district boards for consideration. If it is adopted, it would be desirable to place in charge of the operations a man with some practical knowledge of tree-planting rather than one trained to clerical duties, and it would be worth while to offer adequate pay to a man with the requisite knowledge, though without general educational qualifications. It is possible that such a man might receive practical instruction from the district forest officials; as an alternative it is understood that if a few district boards are prepared to contribute the cost, arrangements might perhaps be made for a course of training at the agri-horticultural society's gardens at Madras.

3. More use might perhaps be made of village agency in planting trees in the immediate neighbourhood of villages outside the circle of the intensive operations suggested in the preceding paragraph. Though the villagers or village heads may shrink from undertaking the maintenance of any great lengths of avenues, it should be possible to arrange with them in some cases for the planting and care of trees in the immediate neighbourhood of their

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villages and some of the money now spent on coolies over whom there is little supervision might profitably be diverted to subsidies to village agencies, payment being made to some extent on results.

4. A pamphlet prepared by M.R.Ry. Rai Bahadur K. Krishnan Nayar, District Board Engineer, Malabar, which contains useful hints on details is printed as an appendix to this order.

(True extract)

R. A. GRAHAM,
Acting Secretary to Government.

To all presidents of district boards.
„ the Revenue Department.

APPENDIX

Avenue planting.

The accompanying summary of instructions issued on avenue planting in the South Kanara district is circulated to all subdivisional and section officers in this district for information and guidance.

2. All expenditure on avenue planting or maintenance should, from this year, be incurred only in such a manner as to be chargeable either to nursery or to a specified batch of plants. Registers should be maintained in the section office subdivision office and the head office showing the charges incurred for each from year to year. When plants are ready to be removed from the nursery, their cost should be calculated and credited to the nursery and charged to the batch. Each batch should be not less than 50 plants nor further apart than one mile and should be consecutively marked A, B, C, etc., for each section. All the banyan and portia planting on one road may, however, receive one distinguishing letter, provided such planting has been done on an extensive scale. At any stage, it should be possible at a glance to see what each batch has cost up to date. A description of the plants and their condition should be noted at the end of each year against the batch and it should be quite easy on the ground to see the result and judge it in view of the cost incurred.

3. Any expenditure incurred on account of old trees either for digging around them removing parasites or other purposes may be shown as miscellaneous expenditure on maintenance, provided it is incurred in accordance with details furnished in the sanctioned estimates.

4. For planting in distant gaps, no avenue coolie can be sanctioned and whatever is possible must be got done by the road coolies.

5. The rain tree grows so fast that, properly looked after, it gets out of danger in two to three months. Here two to three years appear to be taken. It has been seen to grow 1' 1½" in a week. It requires substantial props properly strutted up. When it has grown 12 to 14 feet high it should be cut off at 10 feet height. Till it grows to this height, no branches should be allowed. The branches also require similar pruning to be able to bear the weight of the luxuriant growth.

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6. Cuttings for banyan and portia should be 4 to 6 feet in girth. Pits should be dug and filled for these cuttings. The filling should be sufficiently higher than the ground to allow for settling.

7. Jack, mango, tamarind, margosa, punna and ganuga are among the fruit trees that may be largely planted.

COCANADA,
2nd January 1917.

K. KRISHNAN NAYAR,
District Board Engineer.

[Enclosure]

The instructions issued by the District Board President and the District Board Engineer on the subject of avenue planting now cover nearly 64 foolscap pages of typed or printed matter and a summary of them has become necessary. Where these instructions have been fully carried out, very encouraging results have been obtained, results sufficient to show that the slow growth generally attributed to some plants is mainly due to want of proper attention and the ignoring of some of the elementary principles governing plant life.

2. One distinguishing feature of avenue planting is its great length without breadth. This adds considerably to the cost of rearing the plants and no effort should be spared to hasten their growth after planting and no expenditure grudged which, by advancing the time when they are out of danger, tends to economy in the long run. Besides, a fast growth necessarily requires a uniformly healthy condition and trees so grown will always continue to have a pleasing shape and appearance. A slow or stunted growth at the beginning accounts for the shapeless forms of trees so frequently seen and every lover of trees can recall to his mind the frequent temptations he had to destroy such trees.

3. The chief points requiring attention to secure a fast and healthy growth will be briefly referred to as far as possible in the order of time. At the very outset, it may be stated that too much importance cannot be attached to (1) the necessity of rearing seedlings in pots in a well-managed nursery till they have a well-established root system, (2) the proper preparation of pits dug in advance, allowed to weather and then filled in with good soil (as distinguished from sub-soil) and manure wherever necessary, (3) the securing of fences absolutely proof even against that "arch-enemy of all arboriculture, the ubiquitous goat," (4) the soil round all plant about 2 feet wider than the shadow at noon being kept always free from vegetation of any kind and raked from time to time so as to be always tight and loose and (5) mulching that soil during the dry months of the year.

4. As soon as any planting is decided upon, a complete programme should be prepared showing the nature and cost of work to be done each year till the trees are out of danger as well as a calendar of all duties connected with it to ensure their being attended to in time. Samples of both are given in the printed memorandum of 13th May 1909.

Two years before the planting can be commenced in any place, a nursery should be started in the nearest possible place, where facilities for watering and supervision can be best secured. The seeds secured should be from well-seasoned fruits and all seeds defective in any way should be thrown away. The beds should be thoroughly well drained and may be in rows raised

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6 to 9 inches higher than the paths or drains separating them. The soil should be light and does not require any manure and the coverings layer should be generally as thick as the seeds themselves. After the seedlings have sprouted and grown sufficiently, they should be transplanted into small pots in time to allow this being done without in any way injuring the tap root. The plants may have to remain quite two years in the nursery to secure a well-established root system. Plants removed after a year from the nursery and put into the ground will no doubt for a time grow much larger than those remaining in the nursery but these latter when planted a year later are soon found to overtake the former. During the two years the plants remain in the nursery, they will have to be transferred periodically to larger pots probably about four times. Light rich soil is required for the pots and should be kept well drained. The pots should be full of soil almost up to the brim. Potted plants require watering every day, in the rainy season too when there has been no rain. But the watering should never be profuse. If this is regularly and judiciously done, there will be no water collecting at the surface when any watering is done. As, at every stage, unhealthy plants will have to be rejected, a larger number of seedlings should be raised than will be actually required. How much more depends entirely on the care with which the nursery is managed. With proper attention, about 20 per cent more should suffice.

5. Almost simultaneously with the starting of the nursery, should pits be dug, in the vicinity of the planting proposed, to prepare leaf mould required for the mulching of the soil round the plants in the dry season. These pits should be filled with dry leaves well pressed and trampled down and finally covered with a *thin coat* of soil. If this is not properly supervised, there is the danger of the pit being filled with more of soil than leaves. If any drain is required to intercept drainage, narrow deep trenches may be dug instead of pits. This will have the additional advantage of allowing the dry leaves to be filled in again as the leaf mould is removed. Any touch-me-not cleared on the road side may well be used for this purpose.

If manure is required, it is best to secure it at this stage and store it in pits so that it may get thoroughly rotten by the time it is used.

6. The pits to be prepared for planting may also now be dug so that they may get sufficiently weathered. The dimensions of the pits depend entirely on the soil. In hard soil they may be 5 to 6 feet in diameter. The first three feet of depth should be cylindrical; for the remaining two or three feet of depth, the hole may taper towards the centre. The soil about a foot or a foot and a half in depth and generally distinguishable from the sub-soil by its colour should be stored on one side and the sub-soil kept separately to replace the soil round the pits that will be removed for filling them.

When earth is excavated for road repairs, the top soil which is not good for this purpose may be reserved for filling in avenue pits. Silt cleared from the side drain may also be used. Any filling done long before planting should be dug up. Here a warning is necessary against the practice of depositing side drain earth round trees and plants or adding manure so as to form a basement round them. Such heaps induce the trees to form surface roots above the natural ground level, which must necessarily suffer during the dry weather.

It may be quite possible to make the pits from which materials are removed for road repairs serve the purpose of planting also. Where earth has

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been already removed to some depth along the line of planting and where such removal is likely to continue, it is better to do the planting at the lower level.

7. Materials for fencing should now be thought of and where these are costly and can be made use of again but are too heavy to be conveyed to a different place except at great cost it is desirable to plant only one-half or one-third of the number of plants finally required. The morning sun being more injurious to men and animals, the eastern side of a road should first be given preference over the western. The sun being nine months in the year in the south the southern side should have a similar preference.

A dry thorn fence if it can be maintained in good condition without the materials being stolen appears to be the best. One chief objection to it is the renewal it requires under ordinary conditions but if planting is done according to these instructions, it is found that the trees get out of danger before the fencing requires renewal. Open work of laterite is often too costly. When used they should be at least five feet high and where goats have to be feared, the gaps should not be more than three or four inches at the narrowest end. A table is appended showing how these cages are best constructed. Barbed wire fence has been tried and found to be a failure first against goats and then against other cattle. Mud walls shut out air and light from the plants, are a kind of furnace in the hot weather and foster all kinds of noxious weeds and should be avoided if possible. When used, it is not difficult to provide a large number of holes.

8. No hard and fast rules can be laid down for espacement. Where space permits it, the distance from tree to tree should be equal to the diameter of the crown of a fully developed tree and the distance from the margin of the used road should be half that diameter. For ordinary trees this diameter may be taken as 30 feet and so the trees should be planted 30 feet apart and 15 feet away from the margin of the used road.

9. The best time for planting appears to be when some light showers have heralded the approaching monsoon so that, when a month or more later the monsoon actually breaks, the plants will have sent their roots into the new ground and established themselves there. Some time in advance, all the pits should be filled sufficiently higher than the adjacent ground to allow for the unavoidable settlement. This filling in should never be of wet soil and should be of top soil and manure only, the soil previously kept apart and the soil about a foot away from the edge of the pit being used for the purpose. The filling in should overlap this foot of undug ground and the overlapping portion where the fence would naturally be constructed should be trodden down firmly so as to prevent any drainage water percolating through it into the loose soil in the pit. In sloping ground, a drain may have to be cut on the upper side of the pit to prevent drainage into the pit. The filling in should further slope upwards six to nine inches towards the centre. If the fencing takes some time to construct, this is the time to complete it. If the filling is done some little time before the planting, it will settle sufficiently and the surface has to be restored by a little more filling. If done just before planting, it is necessary to press down the filling a little so as to prevent an excessive settlement.

10. The planting is itself a simple process. Nevertheless some of the most fatal mistakes are made then. Quite a common mistake is to plant them

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too deep from a fancied analogy with the foundation of a building which of course cannot or should not grow downward. Trees like the coconut or the plantain may stand some such partial burial but generally there is no need to place the plants deeper than they were in the nursery and to ensure this, the nursery mark on the plant should be left visible. Another practice common throughout this country and unfortunately sanctioned in some of the standard works on road making is to put a number of seedlings, often of different varieties into the same pit, presumably under the impression that one or the other may survive. This practice cannot be too strongly condemned. If so planted, the young trees will compete for nourishment, moisture and light and will often all die in the struggle or survive as stunted and useless shrubs. In the few cases in which more than one tree survives in healthy condition, it is found hopeless in after years to remove one of them without destroying the balance and shape of the other. If plants are well looked after, there is no need to take any chances and the very few that may die or prove unhealthy can be replaced.

11. Props will be found necessary for almost all plants, particularly as these are not intended to be half buried. Besides, they enable the trees to have a clean, straight, vertical stem. The props should be quite rigid themselves and for this purpose, they require struts fixing them at a height of four to five feet above the ground. Great care is required in tying the plants to the prop. Flat dry plantain fibre can best be used for the purpose and a thick piece of the same can be placed round the plant as a sort of packing. The tying should be periodically redone. No mark of the tying should on any account be allowed to appear on the bark of the tree.

12. Many of the officers having charge of avenue planting are possessed by the one idea that ordering and paying for watering on a large scale will cover a multitude of sins. They do not even see that the watering paid for is done and the men employed are so doubtful about getting payment for all the watering ordered, on account of the inadequate results which they themselves fear, that they always take care to be on the safe side. The result is that some watering is done at inspection time which makes the surface cake and harden, induces the roots to come to the surface to be parched up afterwards and does on the whole more harm than good.

During the period elapsing between planting and the breaking of the monsoon, regular watering will be required. In the next season, a little watering, certainly not on the same scale every month, may be required, say about once in three days in April, May and June, once in five days in January, February and March and once a week in previous months if there has been no rain at all. Even this is capable of being farther reduced. It is best to arrange for this under proper supervision. When watering is done, the ground should be periodically raked to prevent its hardening. If the plants grow properly, no watering should be necessary in subsequent seasons. Nevertheless if the plants are found to suffer from the drought, an occasional profuse watering may be specially arranged for under proper supervision. The mere fact of a plant not growing should not be taken as due to any drought. Plants also require and take rest.

Water is really required a little below the surface. On the surface itself, it is merely wasted and does more harm than good and it is well worth trying

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to secure moisture below, without wetting the surface. If the soil is loose, water poured into broken necks of pots placed round the tree will secure this object.

All the water poured should collect uniformly round the tree but not near the stem and no portion should flow away nor should the watering from and pit. No watering should be permitted between 9 a.m. and 3 p.m.

13. Far more important than watering is the prevention of the soil around the plant from hardening. It should be kept raked from time to time and should be loose and light. No grass, weed or any kind of vegetation should be allowed. These rob the plants of moisture not only for themselves but also form a medium for passing the moisture in the soil into the atmosphere. Even after the plants have developed into young trees and are out of danger, a digging should be given round them both at the beginning and the end of the monsoon. In the first digging it may be sufficient if the clod is broken and overturned; in the second, it should be pulverised. With the first digging any manure thought necessary should be added. As manure will hasten the growth of the plants, it is worth while to incur expenditure on this account. It may be added in varying proportions to different plants to see how far this expenditure is justified. Tank silt and other such rich deposits charred (not burnt) with alternate layers of a litter of dry leaves and twigs and covered with the same soil in such a manner as not to allow the smoke to escape have almost a startling effect on plants.

14. As soon as the dry season commences, the soil round the stem 2 feet wider than the shadow at noon should be covered to a depth of 2 inches with leaf mould or decayed vegetable matter already referred to in paragraph 5. Any watering done should be over this mulched soil. The moisture is then retained much longer and the soil will then neither cake nor crack and the tender roots will not be injured.

15. If the instructions in paragraphs 12 and 13 are fully carried out, there will be no necessity for fire-tracing to protect the plants or trees from being injured by the dry grass in the vicinity taking fire. It will really pay to employ a person who takes interest in the planting to watch their growth from time to time, remove the caterpillars or other insects that injure them and generally to see that all causes that hinder the growth in any way are promptly removed. A system of rewards depending on the healthy growth of plants will have a salutary effect and such discrimination between good and bad work will prove a powerful incentive for good work.

16. The places where rearing of avenue plants is easiest will doubtless receive the first attention. It should, however, not be forgotten that places where they are difficult to rear are often where avenue trees are most required. In a rock plateau devoid of all vegetation, sufficiently large pits may be dug and filled with good soil. This may give a sufficient start to the plants and, if a proper selection of some hardy variety be made, the trees may be able to send their roots into the rock. Where the rock gets hardened, by weathering, the filling in should be done as soon as the pits are opened. At least a little in this direction should be done every year and the road specification may provide for this being done at least in one place in every such furlong. In some cases the excavated soil may be useful for road repairs. Where loose soil is difficult to obtain, all the side drain silt should be stored till it is sufficient to fill in one pit.

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(2)

G.O. No. 2706, L. & M., dated 4th December 1923.

An extract from the Administration report of the Madura District Board for 1922-23 on the substantial results of the policy adopted by that Board in regard to the maintenance and development of avenues is communicated to all other local bodies for information.

(By order of the Government, Ministry of Local Self-Government)

P. L. MOORE,
Acting Secretary to Government.

To all Presidents of District Boards.
" Presidents of Taluk Boards.
" Chairmen of Municipal Councils.
" Collectors.

Copy to the Inspector of Local Boards and Municipal Councils.

APPENDIX.

*Extract from the Administration report of the Madura District Board
for the year 1922-23.*

Tree-planting.—With a view to the proper care of avenues and making them a source of revenue to the District Board as well as a joy to travellers, an attempt has been made to develop a scheme on a sound basis. To make a beginning, a small staff consisting of an avenue superintendent on Rs. 100 plus Rs. 35 fixed travelling allowance, a maistri on Rs. 15, a gardener and an avenue coolie on Rs. 10 each per mensem was appointed in 1921 and continued to work in the present year. The avenue superintendent was trained at Dehra Dun and was strongly recommended by Mr. Cox, the Chief Conservator. This establishment is under the direct control of the President, District Board.

The results already obtained abundantly prove how neglected this subject has been in the past and the great profit that may be expected in the future.

The work of the avenue superintendent has been hitherto chiefly of a preliminary character, as a start from the very beginning has had to be made. The avenue trees in the whole district have been carefully re-numbered and an avenue register has been prepared and is nearly completed showing the following details: serial number of tree, kind, size and approximate market value at the time of last inspection. The register will be brought up-to-date every year, and will also show the disappearance of trees, the cause (windfall or sale), how disposed of, and the value realized. Thus a complete record will be kept of every avenue tree in the district. Incidentally it is of interest to note that the total capital value of the trees now standing in avenues throughout the district amounts on this rough calculation to nearly a crore of rupees.

Generally speaking a tree reaches its maximum value on attaining full maturity. After that, it gradually deteriorates until it dies. In the case of timber trees therefore it is uneconomical to allow a tree to stand after it has attained its full growth. Fruit trees on the other hand continue to yield

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revenue until they cease bearing fruit, when they may still be at the maximum value from the point of view of timber or firewood. Accepting these two principles, which have been entirely ignored in the past, an attempt will be made by careful selection to realize the full market value of every tree. Wanton felling merely for the sake of revenue will be scrupulously avoided as in many cases the real value of a tree is the amount of shade it gives.

The district is singularly fortunate in the fact that some of the great pre-British rulers of the country devoted great attention to the planting of avenues. Especially is this so in the case of Queen Mangammal, one of the last of the Naiks (Circa A.D. 1730). Her roads are still known as 'Mangammal Salais' and her avenues are still standing. Unfortunately, every storm exacts its toll and in many places, especially in recent years, numbers of trees have disappeared. It must be observed that her chief object in planting avenues was to give shade to travellers and her trees are almost entirely shade-trees; but there is no reason at all why this object should not be combined with profit by a more careful selection of the trees to be planted.

The operations of the avenue superintendent are at present confined to a radius of ten miles from Madura, that is practically the Madura taluk. The register above referred to, however, is for the whole district.

A nursery was started last year with the kind permission of the Collector in the compound of the Tamukkam bungalow and was continued this year. Seedlings are transplanted from seed-beds into pots before they are taken to the road-side. The chief plants that have thus been reared are casuarina, vagai, margosa, tamarind, punga, kounai and rain trees. It is found by observation that these trees grow best in this district. A casuarina plantation has already been begun on local fund poramboke by the road-side at Uthangudi about three miles from Madura on the Madura-Melur road at a cost to date of Rs. 587. An arecanut plantation was first tried on this spot but proved a failure. Many of the casuarina plants have grown to a height of 7 feet and have cost about 7 annas each for the first year. The rate of growth is so satisfactory that the plants may not need watering after the second year. Three hundred and six avenue trees have been planted on road No. 3 (Madura-Parapatti) for a distance of about two miles beyond municipal limits at a cost of Rs. 215. Two hundred and thirty-five plants have also been planted in the second and third miles of road No. 4 (Madura to Virudupatti) costing Rs. 188.

The planting and maintenance of avenues have hitherto been in the hands of the Engineering Department and estimates have been sanctioned without much knowledge of what was being done though it must be admitted that in some places fine results have been shown. The avenue superintendent has now been deputed to examine the estimates before they are sanctioned and this has resulted in a large saving. Thus the estimates for maintaining avenues for this year have been cut down from Rs. 10,625 to Rs. 8,600 after careful scrutiny.

As an instance of what can be done by the sale of judiciously selected trees under proper supervision it may be mentioned that the avenue superintendent was ordered to choose a number of vagai trees in the sixth and seventh miles of road No. 27. The Vice-President presided at the auction and 19 trees fetched a sum of Rs. 1,613. Formerly these trees would probably have been sold by maistris and sub-overseers for trifling sums. The

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avenue on this road is very dense and the felling of the trees has caused no noticeable gaps. Similarly 13 trees on road No. 3 realized a sum of Rupees 1,139 in the current year. These operations will be extended to other roads.

A list showing local fund porambokes measuring over half an acre suitable for planting trees is almost ready and it is proposed to take early steps to plant them up with trees yielding fuel, where they are within easy reach of Madura and with coconut, etc., trees in other places.

Plantations in markets were not made during the year under report. The scheme outlined in the preceding paragraphs has only just been begun and the other local boards have not yet had a chance of working together. But it is hoped that they will all do so in the near future.

(3)

G.O. No. 1448, L. & M., dated 30th May 1924.

The attention of all local bodies is again invited to G.O. No. 2706, L. & M., dated 4th December 1923, communicating to them the substantial results achieved by the Madura District Board by the adoption of a systematic policy for the maintenance and development of avenues. It is hoped that every effort will be made to develop this important source of revenue to local bodies and comfort to the travelling public.

(By order of the Government, Ministry of Local Self-Government)

F. L. MOORE,

Acting Secretary to Government.

To all Presidents of District Boards.
 „ all Presidents of Taluk Boards.
 „ all Chairmen of Municipal Councils.
 „ all Collectors.
 „ the Inspector of Local Boards and Municipal Councils.